

Peak Performance

METS and the Minimum Fitness Standard

Jim Muth MS, MPA (jmuth@kbomnmd.com)

One of the most important yet misunderstood pieces of information collected during your annual physical is your functional capacity or, the ***MET*** value obtained from your treadmill stress test. What exactly then is a MET? METS are nothing more than a way for exercise physiologists or health professionals to describe the energy expenditure your body is producing while performing physical work. A MET is an abbreviation for what's called a *metabolic equivalent*. It is also a way of more easily describing an individual's oxygen uptake, or in other words, how much oxygen your body is using when participating in physical activity. Humans are aerobic or oxygen consuming animals. That oxygen consumption can easily be measured and is typically defined as oxygen uptake. Some of you may be familiar with this value as VO_2 . While at rest, humans consume oxygen at a rate of approximately 3.5ml of oxygen per kilogram of body weight per minute or $3.5\text{ml/kg}\cdot\text{min}^{-1}$. Kind of like human gas mileage. (No Laughing). This value is equivalent to 1 MET or one *metabolic equivalent*. Confused? Don't be. Rather than describe energy expenditure as VO_2 it is much easier to describe the value in METS or multiples of resting metabolism. When someone is doing something other than resting he/she is consuming oxygen at some multiple of resting metabolism.

Law enforcement officers and firefighters are ***required*** to be involved in activities that may necessitate substantial energy expenditure. Examples include structural and range land firefighting, physical confrontations with uncooperative suspects and rescuing individuals in life threatening situations. The oxygen uptake of these activities has been measured and ranges from 12-16MET's depending upon the situation that an officer or firefighter is confronted. Most occupations as you can imagine, do not require energy expenditures anywhere near this level. It therefore, becomes more evident that if a peace officer or firefighter cannot complete a minimum of 10.1MET's on a treadmill, in a controlled situation how then would they be capable of participating in an occupationally required activity of 12-16MET's? In addition, the effect of adrenaline on a peace officer or firefighter when involved in an emergency situation is metabolically ***VERY*** costly.

As you can now see, the fitness requirement that has been established for your annual physical is not some arbitrary number. It is a well-researched value that tells those of us involved with your annual physical if you are demonstrating the necessary fitness level that matches the work you are required to perform. Make sure you discuss this and your entire test results with your medical provider.

What is nice to see is that some of you take this value seriously and have developed a fun competition among yourselves to see who can achieve the highest MET value in the state. Keep up the good work!!!



MET Values of Various Leisure Activities

Activity	Mean	Range
Basketball	8.3	7-12+
Boxing	10	8-13
Cycling - Pleasure		3-8
Cycling – 10mph	7	
Golf - Walking		4-7
Golf – Cart		2-3
Hiking		3-7
Mountain Climbing		5-10
Running		
12 min per mile	8.7	
11 min per mile	9.4	
10 min per mile	10.2	
9 min per mile	11.2	
8 min per mile	12.5	
7 min per mile	14.1	
6 min per mile	16.3	
Swimming		4-8+
Tennis	6.5	4-9+
Volleyball		3-6

The table above lists some common activities and their associated MET value.
Use the equation below to calculate the caloric cost of activities you enjoy!!!!

Calculating the caloric cost of exercise based on MET values

The caloric cost of exercise can easily be calculated from the predicted MET value using the following equation –

$$\text{Kcal/min} = (\text{METS} \times 3.5 \times \text{body weight in kg}) / 200$$

Visit the American College of Sports Medicine's Website at www.acsm.org for more information

FACTS ABOUT HEPATITIS

With all the troubles surrounding the Endoscopy Centers here in Las Vegas a number of officers have either called or stopped by the office to ask questions about their risk for contracting Hepatitis C. Although Officers should be familiar with the transmission of Hepatitis and the differences in the strains, a number of officers are still confused as to the types of the virus and their modes of transmission. Outlined below is a brief comparison of the 3 different types of virus and how each are transmitted, prevented and treated. Make sure to discuss this in detail with your medical provider either at the time of your annual physical or with your primary care physician. The table below outlines these primary differences:



Type	Transmission	Prevention	Treatment
Hepatitis A (HAV)	Fecal-Oral. Typically transmitted through contaminated food and water.	Vaccination -2 inoculations given 6 months to 1 year apart.	None-Supportive treatment only. Death is rare-Approx. 100/yr. in the U.S.
Hepatitis B (HBV)	Blood-borne- Contaminated body fluids. 200-300 million carriers world wide. 250K die world wide each year. Highest cause of liver cancers.	Vaccination -3 inoculations given over a 6 month period. All Officers and Firefighters are offered the vaccine at the time of employment. Everyone should consider vaccination	None-Although Interferon is effective in 25%-50% of cases.
Hepatitis C (HCV)	Blood-borne- Contaminated body fluids. IV drug users who share needles are at highest risk and those who have unprotected sex with multiple partners.	There is no vaccination for HCV.	None-Although a combination of Interferon and Ribavirin may be effective in up to 50% of cases.

Visit the CDC's web site at www.cdc.gov for detailed information about Hepatitis.

MET Values

<u>Name</u>	<u>Agency</u>	<u>MET Value</u>
ABEYTA, Eloy	P&P - SN	19.1
ARMSTRONG, Greg	P&P - SN	20.6
BOGDEN, Brett	NHP - SN	16.1
CRISP, Anthony	NHP - Rural	16.8
DANTONIO, Mike	P&P - SN	20.1
EDGELL, Michael	NHP - NN	16.8
ELY, Tom	P&P - SN	16.8
GONZALEZ, Jorge	NDF - SN	20.0
HURLEY, Mike	DMV - SN	17.0
KEMMER, Eric	NHP - SN	16.8
LEONARD, Russell	NDF - SN	20.7
OSTERMAN, Michael	NHP - Rural	16.8
PAGE, Adam	P&P - SN	18.2
PAYTON, Callan	NDF - Rural	17.2
RIVERA, Carlos	NHP - SN	19.3
STANKUS, Beth	P&P - SN	16.1
STEERE, Russell	DOC - NN	16.8
STUENKEL, Scott	NHP - SN	17.2
TWIDDY, Ken	NHP - SN	18.2
VELA, Laurie	P&P - NN	16.8
WONG, Juan	NDF - SN	21.4
WRIGHT, Ken	P&P - SN	18.3

Employees making substantial health improvements:

BRANCH, Mike-NHP - SN
CHANDLER, Jeff-DOC - Rural
COBB, Cynthia-DOC - SN
HOI-KIT, Tam-DOC - SN
IRWIN, Teacia-DOC - NN
LAWVER, John-DOC - NN
MINEGAR, Roger-DOC - NN
YOUNG, Kevin-P&P - NN
WIEDEN, Jennifer-DOC - SN

CORRECTIONS-In the **January 2008** issue of Peak Performance we addressed caloric need and calculating your BMR. There was an error in the equation for calculating the BMR for females. At the beginning of the equation the BMR states 65 + when the corrected version should be 655 + . We encourage our readers to make a point of letting us know when there are errors in Peak Performance. We will make every effort to assure accuracy of the information contained in the newsletter.

We will continue to keep you informed on topics ranging from the Heart Lung Program, to diet, exercise and nutritional advice. We encourage you to drop the Risk Management Division a note at 201 S. Roop St, Ste 201, Carson City, NV 89701, or call 775.687.3194. We are always looking for guest contributors to relate personal accomplishments and success stories. You can also drop a note or e-mail Josh Wilson @ wilson_jr@willis.com or Jim Muth @ jmuth@kbomanmd.com. Either of them will be happy to answer questions and provide information on wellness and a heart healthy lifestyle.